CLAIMS

1. An apparatus for control of echo return loss in a communication system using a packet switched network, the communication system comprising a telephone device having a plurality of transducers and a computer for running a communication process, the apparatus comprising:

a converter coupled to the telephone device, the converter generating analog signals from digital signals and digital signals from analog signals;

a bus interface coupled to the computer, the bus interface coupling the apparatus to the communication system; and

a controller coupled to the converter and the bus interface, the controller controlling operation of the apparatus by detecting and attenuating echo conditions.

2. The apparatus of claim 1 wherein the bus interface is a Universal Serial Bus interface.

3. The apparatus of claim 1 wherein the controller is a microprocessor that comprises means for detecting an input signal's relative amplitude and means for inserting attenuation in a transmit or receive signal in response to the amplitude.

4. The apparatus of claim 1 wherein the converter comprises a codec.

5. The apparatus of claim 1 wherein the telephone device comprises a telephone handset and the plurality of transducers comprise a microphone and a speaker.

6. The apparatus of claim 1 wherein the telephone device comprises a telephone headset and the plurality of transducers comprise a microphone and a speaker.

7. The apparatus of claim 1 and further including a side tone path coupled between an input and an output of the converter, the side tone path inserting a side tone in a signal from the output of the converter in response to an input signal.

8. A method for controlling echo return loss in a computer-based communication device coupled to a packet switched network, the method comprising the steps of:

detecting a receive linear signal from the communication device;

detecting a transmit linear signal from the communication device;

measuring a relative amplitude of the receive linear signal;

measuring a relative amplitude of the transmit linear signal;

if the relative amplitude of the receive linear signal is greater than a switching threshold, attenuating the transmit linear signal; and

if the relative amplitude of the transmit linear signal is greater than the switching threshold, attenuating the receive linear signal.

9. The method of claim 8 and further including the step of if the relative amplitudes of both the receive linear signal and the transmit linear signal are above the switching threshold, attenuating the receive linear signal.

10. The method of claim 8 wherein the step of attenuating the transmit linear signal includes full attenuation of the transmit linear signal.

11. The method of claim 8 wherein the step of attenuating the receive linear signal includes full attenuation of the receive linear signal.

12. The method of claim 9 wherein the step of attenuating the receive linear signal includes partial attenuation of the receive linear signal.

13. The method of claim 8 wherein the step of measuring a relative amplitude of the receive linear signal includes detecting an envelope of the receive linear signal.

14. The method of claim 8 wherein the step of measuring a relative amplitude of the transmit linear signal includes detecting an envelope of the transmit linear signal.

15. A communication system that communicates over a packet switched network, the communication system comprising:

a telephone device comprising a plurality of transducers;

an audio interface coupled to the telephone device, the audio interface comprising:

a codec coupled to the telephone device, the codec having means for converting transmit analog signals from the telephone device to transmit digital signals and the codec also having means for converting receive digital signals from the packet switched network to receive analog signals for use by the telephone device; and

a controller comprising a bus interface and a microprocessor for controlling the audio interface, the microprocessor having means for detecting an input signal's relative amplitude and controlling attenuation of the transmit and receive digital signals in response to the input signal's relative amplitude; and

a computer coupled to the bus interface and the packet switched network, the computer comprising a controller that runs a communication process.

16. A method for controlling echo return loss on a computer-based internet protocol communication apparatus, the communication apparatus comprising a telephone device that generates an analog voice signal, a codec, and a microprocessor, the communication apparatus receiving a receive digital linear signal from an internet protocol network, the method comprising the steps of:

the codec converting the analog voice signal to a transmit digital μ-law signal;

converting the transmit digital μ-law signal to a transmit digital linear signal;

sampling the transmit digital linear signal to generate transmit measured samples;

averaging the transmit measured samples over time to produce a transmit speech envelope;

sampling the receive digital linear signal to generate receive measured samples;

averaging the receive measured samples over time to produce a receive speech envelope;

if the receive speech envelope indicates receive speech is present, attenuating the transmit digital linear signal; and

if the transmit speech envelope indicates transmit speech is present, attenuating the receive digital linear signal.

17. The method of claim 16 and further including the step of if both the receive and transmit speech envelopes indicate speech in their respective signals, partially attenuating the receive digital linear signal.

18. The method of claim 16 and further including the steps of:

converting the receive digital linear signal to a receive digital μ-law signal; and

converting the receive digital μ-law signal to an analog signal for use by the telephone device.

19. An apparatus for control of echo return loss in a computer-based internet protocol communication system, the apparatus comprising:

means for converting a transmit digital μ-law signal to a transmit linear signal;

means for sampling the transmit linear signal to generate transmit measured samples;

means for averaging the transmit measured samples over time to generate a transmit speech envelope;

means for sampling a receive linear signal to generate receive measured samples;

means for averaging the receive measured samples over time to generate a receive speech envelope;

means for comparing relative amplitudes of both the transmit speech envelope and the receive speech envelope;

means for inserting receive attenuation in the receive linear signal, coupled to the means for comparing, in response to detection of speech in the transmit speech envelope; and

means for inserting transmit attenuation in the transmit linear signal, coupled to the means for comparing, in response to detection of speech in the receive speech envelope.

20. The apparatus of claim 19 and further including means for converting the receive linear signal to a receive μ-law digital signal.

21. The apparatus of claim 20 and further including means for converting the receive μ-law digital signal to an analog signal for use by the communication system.